## Index

Note: Page numbers of article titles are in **boldface** type.

```
Α
```

```
ACCLAIM evaluation, for joint health products, 126
Acute renal failure, geriatric care for, in rabbits, 124
Adenitis, of preputial gland, in ancient rats, 98-99
Adenocarcinomas, geriatric care for, in ferrets, 116
      in guinea pigs, 92
      in psittacines, 41
      in rabbits, 128
      in rats. 99
Adenomas, geriatric care for, in ferrets, 116
      in guinea pigs, 91-92
      in rats, 101
Adrenal tumors, geriatric care for, in ferrets, 111-112
Age estimation, in psittacines, 27-28
   in raptors, 53-54
   in reptiles, 16-20
Aging pathology. See Senescence.
Air sac carcinomas, geriatric care for, in psittacines, 145
Allopurinol, in geriatric care, for psittacines, 35, 44
Alopecia, geriatric care for, in ferrets, 111, 113
      in guinea pigs, 91
      in rats. 99
Alveolar histiocytosis, geriatric care for, in rats, 99
Alzheimer disease, in psittacines, 29
Amyloid precursor protein (APP), in geriatric psittacines, 29
Anastrozole (Arimidex), in geriatric care, for ferrets, 112-113
Anemia, geriatric care for, in ferrets, 110, 118-119
Anesthetic agents, in geriatric care, for ferrets, 109
      for fish patients, 10
      for guinea pigs and chinchillas, 87-89
      for psittacines, 38
      for rabbits, 129-130
      for raptors, 76
      for rats. 102
      for reptiles, 22
Angiotensin-converting enzyme (ACD) inhibitors, in geriatric care, for psittacines, 36, 44
      for rats, 98-99
Anorexia, geriatric care for, in ferrets, 108, 110
      in psittacines, 34
      in reptiles, 22
Anthrasilicosis, geriatric care for, in psittacines, 144
```

Vet Clin Exot Anim 13 (2010) 151–169 doi:10.1016/51094-9194(10)00009-5 vetexotic.theclinics.com 1094-9194/10/\$ − see front matter © 2010 Elsevier Inc. All rights reserved.

```
Antibiotics, in geriatric care, for guinea pigs and chinchillas, 87
      for rabbits, 128-129
      for rats, 98, 101
Anticonvulsants, for chronic pain. See Gabapentin.
Antidepressants, tricyclic, in geriatric care, for raptors, 63
Antioxidants, in geriatric care, for psittacines, 135-136
Aquatic ecosystems, for geriatric fish patients, 2–3
      environmental quality of, 3, 6
Arthritis, geriatric care for, in psittacines, 32
      in rabbits, 125-126
Aspirin, in geriatric care, for psittacines, 41
Asthma, geriatric care for, in psittacines, 37
Atenolol, in geriatric care, for ferrets, 116
Atherosclerosis, geriatric care for, in psittacines, 31, 36-38, 136, 138-140, 145
         histologic staging of, 139
      in rabbits, 124
      in raptors, 66, 68
      in rats. 100
      in reptiles, 23
Atropine, in geriatric care, for psittacines, 44
Autoimmune diseases, geriatric care for, in psittacines, 36
 В
Bearded dragons, age estimation of, 18, 20
Benzodiazepines, in geriatric care, for rabbits, 130
β-Blockers, in geriatric care, for ferrets, 116
Bicalutamide (Casodex), in geriatric care, for ferrets, 112-113
Bile duct proliferation, geriatric care for, in psittacines, 141
      in rats, 100
Biliary carcinoma, geriatric care for, in psittacines, 41
Biopsy, in geriatric care, for ferrets, lymph node, 115
         renal, 118
      for psittacines, musculoskeletal, 41
         renal, 35
Birds. See Psittacines.
   of prey. See Raptors.
Blindness, geriatric care for, in ferrets, 119
      in psittacines, 30-31
Blood pressure (BP) measurements, indirect, in geriatric care, for psittacines, 38
         for rabbits, 125
Blood sampling and imaging, in geriatric care, for ferrets, 109, 112, 115, 118
      for guinea pigs and chinchillas, 90-91
      for psittacines, 37, 43
      for raptors, 66
      for rats, 97, 101
      for reptiles, 20-21, 24
Bronchogenic papillary adenoma, in geriatric guinea pigs, 92
Bumblefoot. See Pododermatitis.
Buprenorphine (Buprenex), in geriatric care, for psittacines, 29, 44
      for rabbits, 130
```

```
Butorphanol tartrate (Torbutrol), in geriatric care, for psittacines, 29-30, 44
      for rabbits, 129-130
 C
Calcium phosphate deposits, in kidneys, in ancient rats, 98
Calculi, urinary, geriatric care for, in fish patients, 10
         in rats, 98
Captopril, in geriatric care, for ferrets, 116
Carboplatin, in geriatric care, for psittacines, 41–42
Carcinomas, geriatric care for, in psittacines, air sac, 145
         gastrointestinal, 41
         hematological, 146
         hepatic, 41-42
         internal, 41
         reproductive, 145-146
         squamous cell, 40
Cardiomyopathy, geriatric care for, in ferrets, 116–117
      in rabbits, 124-125
      in rats. 99
Cardiovascular system, geriatric care for, in psittacines, 36–38, 136–140
      in rabbits, 124-125
      in raptors, 65-69
      in rats, 99-100
      in reptiles, 23
Carprofen (Rimadyl), for chronic pain, in rabbits, 125
      in raptors, 62
Cataracts, geriatric care for, in ferrets, 119
      in fish patients, 10
      in psittacines, 30, 144-145
      in rabbits, 128
      in raptors, 69, 71
      in reptiles, 24
Catarrhal enteritis, epizootic, in ferrets, 110
Central nervous system degeneration, geriatric care for. See also Senility/dementia.
      in raptors, 74
      in rats, 100
Cerebral/cerebellar conditions, geriatric care for, in raptors, 74
Cheek tooth overgrowth, geriatric care for, in guinea pigs and chinchillas, 88-89
Chemotherapy, in geriatric care, for ferrets, 115
      for psittacines, 41-42
      for raptors, 65
Chinchillas, geriatric diseases of, 85-93
      cheek tooth overgrowth and malocclusion as, 88-89
      diabetes mellitus as, 90-91
      diet and husbandry related, 86-90
      neoplasia as, 91-92
      not associated with diet or husbandry, 86-90
      pododermatitis as, 87-88
      renal failure as, 91
      spurs as, 88
```

summary overview of, 85-86

Chondromas, geriatric care for, in psittacines, 41 Chronic diarrhea, geriatric care for, in ferrets, 111 Chronic otitis, geriatric care for, in rabbits, 128 Chronic pain, geriatric care for, in psittacines, 29-30 Chronic progressive nephrosis/nephropathy (PGN, CPN), geriatric care for, in rats, 96-98 Chronic renal failure, geriatric care for, in rabbits, 123-124, 129 Cirrhosis, of liver, in aging psittacines, 139–141 Cisplatin, in geriatric care, for psittacines, 41 Cloacal disease, geriatric care for, in psittacines, 33 Cobalamin therapy, in geriatric care, for ferrets, 111 Cognition, in aging raptors, 71, 74 in geriatric psittacines, 29 Colchicine, in geriatric care, for psittacines, 34-35, 44 Congestive heart failure, geriatric care for. See Cardiomyopathy. Consultation, in geriatric care, initial, for reptiles, 20 ophthalmology, for psittacines, 31 Corneal lipidosis, geriatric care for, in reptiles, 24 Crocodilians, age estimation of, 19 Cushing disease, in ferrets, 111 Cystadenomas, rete, in geriatric guinea pigs, 91–92 Cystic ovarian disease, geriatric care for, in guinea pigs, 91-92 in psittacines, 39 Cystic renal disease, geriatric care for, in ferrets, 117–118 D DDT toxins, geriatric care for, in raptors, 54-55 Degenerative changes, in central nervous system. See also Senility/dementia. geriatric care for, in psittacines, 145 in raptors, 74 in rats, 100 Degenerative joint disease, geriatric care for, in psittacines, 140-142 in rabbits, 125-126 in raptors, 57, 60-62 in rats, 100 in reptiles, 21, 23 Dementia. See Senility/dementia. Dental disease, geriatric care for, in ferrets, 108, 119 in guinea pigs and chinchillas, 88-89 in rabbits, 127 in reptiles, 22 Dermatitis. See also Pododermatitis. geriatric care for, in psittacines, ulcerative, 141 in rabbits, perineal, 128, 130 Dermatologic disease. See Integument disorders. Dexamethasone suppression test, for adrenal cortical tumors, in senior ferrets, 112 Diabetes mellitus, geriatric care for, in guinea pigs and chinchillas, 90-91 in psittacines, 35-36 Diarrhea, chronic, in senior ferrets, 111 Diazoxide, in geriatric care, for ferrets, 114 Diclofenac, in geriatric care, for psittacines, 29

Diet. See Nutrition. Digestive system. See Gastrointestinal entries. Digoxin, in geriatric care, for ferrets, 116 for rabbits, 125 DNA, in aging psittacines, 28, 136 Ε Echocardiography, in geriatric care, for psittacines, 38 for rabbits, 124 for raptors, 66-68 Electrocardiogram (ECG), in geriatric care, for psittacines, 38 for raptors, 66-67 Electrocution, geriatric care for, in raptors, 55-56, 60 Enalapril (Enacard), in geriatric care, for psittacines, 36, 44 for rabbits, 125 for raptors, 69 Encephalitozoon cuniculi (ECUN), diseases related to, in geriatric rabbits, 124-125, 128 Endocardiosis, geriatric care for, in rabbits, 124-125 Endocrine system, geriatric care for, in psittacines, 35-36, 42 in reptiles, 24 End-of-life issues, of geriatric rabbits, 130-131 Endoscopy, in geriatric care, for raptors, 66 Enteritis, epizootic catarrhal, in ferrets, 110 Environment, in geriatric care. See also Husbandry. for fish patients, aquatic ecosystems and, 3, 6 for raptors, wild vs. human impacts, 52-57 Epicardial fat, in aging psittacines, 37, 136 Erythropoietin, in geriatric care, for ferrets, 118-119 for rabbits, 124 Ethics, of evidence-based medicine, for geriatric psittacines, 28 Etomidate, in geriatric care, for rabbits, 130 Euthanasia, in geriatric care, for ferrets, 120 for fish patients, 10-11 for rabbits, 131-132 for reptiles, 24 Evidence-based medicine (EBM), for geriatric psittacines, 27-28 Extramedullary hematopoiesis, in ancient rats, 100 in ferrets, 119-120 in psittacines, 141 F Falconry, use of raptors for, 51-52 Feeding tubes, in geriatric care, for rabbits, 130 Fentanyl (Duragesic), in geriatric care, for psittacines, 30, 44 Ferrets, senior, 107-122 common geriatric diseases of, 110-120 cardiomyopathy as, 116-117 cataracts as, 119

dental, 108, 119

```
Ferrets (continued)
         gastrointestinal, 107-108, 110-111
         insulinoma as, 108, 113-114
         lymphoma as, 114-115
         neoplasia as, 111-113, 116
         renal, 117-119
         splenomegaly as, 119-120
      dealing with loss of, 120
      diet for, 108
      husbandry for, 107-108
      physical examination of, 109
      preventive care for, 109-110
      restraint of, 109
      summary overview of, 107
      venipuncture for, 109
      veterinary care for, 108-109
Fibrosarcomas, geriatric care for, in fish patients, 9
      in psittacines, 40
Fibrosis, of liver, in aging psittacines, 141-143
Fish patients, geriatric veterinary care for, 1-14
      cataracts and, 10
      environmental quality and, 3, 6
      euthanasia and, 10-11
      infectious diseases and, 7-8
      longevity and, 1-2
         in public aquaria communities, 2-3
         record life spans for common species, 2, 4-5
      neoplasia and, 9-10, 28
      nutritional concerns and, 6-7
      public aquaria communities and, 2-3
      reproductive problems and, 9
      senescence and, 1-2
      summary overview of, 1, 11
      urinary calculi and, 10
Fluid supplementation, in geriatric care, for ferrets, 110
      for rats, 98
Flutamide (Eulexin), in geriatric care, for ferrets, 112-113
Free radical-induced cell injury, in aging psittacines, 28, 136
Furosemide, in geriatric care, for ferrets, 116
      for psittacines, 44
      for rabbits, 125
 G
Gabapentin, for chronic pain, in psittacines, 30
      in raptors, 63
Gastrointestinal system, geriatric care for, in ferrets, 107-108, 110-111
      in psittacines, 33-34, 41
      in reptiles, 22-23
Gastrointestinal (GI) tract neoplasia, geriatric care for, in psittacines, 33, 41
Genitourinary disease, in ancient rats, 98-99
```

calculi as, 98 of female genital track, 99 of male genital track, 98-99 Geriatric veterinary care, for ancient rats, 95-105. See also Rats. for ferrets, 107-122. See also Ferrets. for fish, 1-14. See also Fish patients. for guinea pigs and chinchillas, 85-93. See also Chinchillas; Guinea pigs. for psittacines, 27-49. See also Psittacines. aging pathology in, 135-150 for rabbits, 123-133 for raptors, 51-84. See also Raptors. for reptiles, 15-25. See also Reptile geriatrics. GIF Tube Implant Kit, for acute renal failure, in rabbits, 124 Gingivitis, geriatric care for, in ferrets, 119 Glaucoma, geriatric care for, in psittacines, 31 in raptors, 69, 71 Glipizide, in geriatric care, for guinea pigs and chinchillas, 90 Golden eagle, torticollis in, 74-75 Gonadotropin-releasing hormone system, in geriatric care, for ferrets, 112-113 for psittacines, 39, 41, 142 Gout, geriatric care for, in psittacines, 33-35, 138 in raptors, 69 in reptiles, 23 Guinea pigs, geriatric diseases of, 85-93 cheek tooth overgrowth and malocclusion as, 88-89 diabetes mellitus as, 90-91 diet and husbandry related, 86-90 hypovitaminosis C as, 86-87 neoplasia as, 91-92 not associated with diet or husbandry, 86-90 ovarian cysts as, 91 pododermatitis as. 87-88 renal failure as, 91 scrotal plugs as, 89-90 spurs as, 88 summary overview of, 85-86 vaginitis as, 89-90

## н

Hawks, intraocular pressure measurement in, 71, 73 Hearing, geriatric care for, in psittacines, 31-32 Heartworm disease, geriatric care for, in ferrets, 109-110, 116-117 Hemangiomas, geriatric care for, in psittacines, 146 Hemangiosarcomas, geriatric care for, in ferrets, 116 in psittacines, 146 Hematopoiesis, extramedullary, in ancient rats, 100 in ferrets, 119-120 in psittacines, 141

```
Hepatic disease, geriatric care for, in ferrets, 108, 116
      in fish patients, 7
         diet-related, 7
      in psittacines, 33-34, 137
         chronic, 141-142
         neoplastic, 41-42
      in raptors, 69
      in rats. 100
Hepatic lipidosis, geriatric care for, in ferrets, 108
      in fish patients, 7
      in psittacines, 33-34
Hepatic neoplasia, geriatric care for, in psittacines, 41-42
Histiocytosis, alveolar, in ancient rats, 99
Hospice, in geriatric care, for rabbits, 130-131
Human aging model, for geriatric psittacines, 28
Human use, of raptors, 51-53
      for falconry, 51-52
      wildlife vs., 52-53
      by zoologic institutions, 52
Husbandry, in geriatric care, for ferrets, 107-108
      for fish patients, 3, 6
         public aguaria communities and, 2-3
      for guinea pigs and chinchillas, 86-90
      for rabbits, 126, 130-131
      for raptors, direct human impacts on, 51-53, 57
         indirect human impacts on, 54-56
         therapeutic strategies in, 61
         wild environment impact on, 52-53, 56-57
      for rats, 102
      for reptiles, 16, 18, 20, 22, 24
Hyaluronic acid, in geriatric care, for rabbits, 125-126
Hydrogen sulfide (H<sub>2</sub>S), in aquatic ecosystems, of geriatric fish patients, 6
Hydromorphone, in geriatric care, for rabbits, 130
Hyperglycemia. See Diabetes mellitus.
Hyperparathyroidism, secondary renal, in geriatric reptiles, 23
Hypertension, pulmonary, in aging psittacines, 36
Hypocalcemia, geriatric care for, in reptiles, 24
Hypothyroidism, geriatric care for, in reptiles, 24
Hypovitaminosis C, geriatric care for, in guinea pigs, 86-87
 Ī
Immune system, geriatric care for, in raptors, 76
      in reptiles, 24
Infectious diseases, geriatric care for, in ferrets, 110-111, 117
      in fish patients, 7-8
      in psittacines, 37, 142-144
      in rabbits, 124-125
      in raptors, 56-57, 68, 71, 74
      in rats, 101
      in reptiles, 24
```

Integument disorders, geriatric care for, in ferrets, 111, 113, 116 in guinea pigs and chinchillas, 87-88, 91 in psittacines, 137, 140-141 in rabbits, 128 in raptors, 76 in rats. 99 in reptiles, 22 Interstitial cell tumors, geriatric care for, in rats, 101 Interstitial fibrosis, pulmonary, in aging psittacines, 143-144 Interstitial nephritis, geriatric care for, in ferrets, 117 in psittacines, 136-137 in rabbits, 124 Intraocular pressure, geriatric care for, in raptors, 69, 71–73 Iris atrophy, geriatric care for, in psittacines, 30-31 Ischemic events, cerebral, in aging raptors, 74 Islet cell hyperplasia/tumors, pancreatic, in aging psittacines, 35 in senior ferrets, 108, 113-114 Joint disease, geriatric care for, arthritic. See Arthritis. degenerative. See Degenerative joint disease. Joint health products (JHPs), in geriatric care, for rabbits, 126 Κ Keratopathy, lipid, in geriatric reptiles, 24 Ketamine, in geriatric care, for rabbits, 129-130 Ketoprofen, in geriatric care, for psittacines, 29 for rabbits, 125 Kidney pathology. See Renal entries. L Laboratory studies. See *Blood sampling and imaging*. Lacrimal function, geriatric care for, in raptors, 69-70 Lafora bodies, in psittacines, 145 Legal guidelines, of evidence-based medicine, for geriatric psittacines, 28 Leiomyoma, uterine, geriatric care for, in guinea pigs and chinchillas, 92 Leukemia, large granular lymphocytic, in ancient rats, 101 Leuprolide acetate (Depo-Lupron), in geriatric care, for ferrets, 112-113 for psittacines, 39, 44 Lidocaine block, in geriatric care, for rabbits, 129-130 Life expectancy/span. See Longevity. Lighting, in aquatic ecosystems, of geriatric fish patients, 6 Lipid metabolism disorders, geriatric care for, in psittacines, 37–38 in reptiles, 23 Lipidosis, geriatric care for, cardiovascular, in psittacines, 37, 136 corneal, in reptiles, 24 hepatic. See Hepatic lipidosis.

Inflammatory bowel disease, in senior ferrets, 111 Insulinoma, geriatric care for, in ferrets, 108, 113–114

```
Lipofuscin accumulation, geriatric care for, in psittacines, 136, 139-140, 145
Lipomas, geriatric care for, in fish patients, 9
      in psittacines, 39-40
Liposome-encapsulated butorphanol tartrate (LEBT), in geriatric care, for psittacines,
   30.44
Liver pathology. See Hepatic entries.
Lizards, age estimation of, 19
Longevity, geriatric care and, in ferrets, 108–109
      in fish patients, 1-2
         public aquaria communities and, 2-3
         record life spans for common species, 2, 4-5
      in psittacines, atypical models of, 28-29
         human aging and, 28
         senility/dementia and, 29
      in raptors, 54-57
         record life spans for common species, 54, 58-59
      in rats, 102
      in reptiles, 17-20
   reproductive. See Reproductive system.
Lymphoblastic lymphoma, geriatric care for, in ferrets, 115
Lymphocytic leukemia, large granular, in ancient rats, 101
Lymphocytic lymphoma, geriatric care for, in ferrets, 115
Lymphoma, geriatric care for, in chinchillas, 92
      in ferrets, 114-115
      in psittacines, 42
Lymphoproliferative disorders, geriatric care for, in reptiles, 24
Lymphosarcoma, geriatric care for, in fish patients, 9-10
      in psittacines, 42
 м
Macaw asthma, geriatric care for, in psittacines, 37
Malocclusion, geriatric care for, in guinea pigs and chinchillas, 88-89
Mammary tumors, geriatric care for, in rats, 101
Medetomidine, in geriatric care, for rabbits, 129
Medication administration, in geriatric care, for psittacines, 42-44
         agents mentioned, 43-44
         quality of life with, 42-43
      for rabbits, 125–126
         modification of, 129-130
      for rats, 102
Melanomas, geriatric care for, in psittacines, 40
Melatonin, in geriatric care, for ferrets, 112-113
Meloxicam (Metacam), in geriatric care, for guinea pigs and chinchillas, 87
      for psittacines, 29, 44
      for rabbits, 125, 129
      for raptors, 62
Metabolic disorders. See also Diabetes mellitus; Gout.
   geriatric care for, in raptors, 69
Metal toxicities, geriatric care for, in ferrets, 118-119
      in fish patients, 6
```

Metalloproteinases, in geriatric care, for rats, 99 Metastatic calcification, geriatric care for, in guinea pigs, 91 Midazolam, in geriatric care, for rabbits, 129-130 Morbidity events, of raptors, aging and, 54-57 Mortality events, of raptors, aging and, 54-57 Murine respiratory mycoplasmosis (MRM), in ancient rats, 101 Muscle wasting, geriatric care for, in ferrets, 108 in psittacines, 140, 142 in rabbits, 127-128 in reptiles, 23 Musculoskeletal system, geriatric care for, in ferrets, 113 in psittacines, 32-33, 41, 137, 142 in rabbits, 127 in raptors, 57, 60-63 in rats, 100-101 in reptiles, 23 Mycobacteriosis, geriatric care for, in fish patients, 7–8 Mycoplasmosis, murine respiratory, in ancient rats, 101 Myelolipomas, geriatric care for, in psittacines, 146 Myocardial disease. See Cardiomyopathy. Myocardial fat, in aging psittacines, 37, 136 Ν Natural disasters, geriatric care for, in raptors, 56 Necropsy, in geriatric care, for ferrets, 117 for fish patients, 11 for psittacines, 37 for raptors, 65-66, 68 Neoplasia, geriatric care for. See also specific pathology. in ferrets, 111-113, 116 in fish patients, 9-10 in guinea pigs and chinchillas, 91-92 in psittacines, 28, 31, 33-42, 137, 145-146. See also Carcinomas. in rabbits, 124, 128-129 in raptors, 63-65, 75 in rats, 99, 101 in reptiles, 22-24 Nephritis, geriatric care for, in ferrets, interstitial, 117 in psittacines, bacterial, 35 interstitial, 136-137 in rabbits, interstitial, 124 Nephrocalcinosis, geriatric care for, in rats, 98 Nervous system, geriatric care for, in psittacines, 137, 145 in raptors, 71, 74-75 in rats, 100 in reptiles, 24 Neurofibroma, geriatric care for, in fish patients, 9 Neutraceuticals, in geriatric care, for raptors, 63 Nitric oxide (NO), for pulmonary hypertension syndrome, in psittacines, 36 Nitrogen cycle, in aquatic ecosystems, of geriatric fish patients, 3, 6

```
Nitroglycerin, in geriatric care, for ferrets, 116
Nonsteroidal antiinflammatory drugs (NSAIDs), 62
   for chronic pain, in aging raptors, 62-63
      in geriatric psittacines, 29, 35, 44
Nuclear sclerosis (NS), geriatric care for, in psittacines, 31
Nutraceuticals, in geriatric care, for raptors, 63
Nutrition, in geriatric care, for ferrets, 108, 113–114, 119
      for fish patients, 6-7
      for guinea pigs and chinchillas, 86-90
      for psittacines, 33-35, 37-38
      for rabbits, 124-125, 127, 130
      for rats, 97-98, 100-102
      for reptiles, 23-24
 0
Obesity, geriatric care for, in raptors, 68, 76
Ocular disease. See also Vision.
   geriatric care for, in ferrets, 119
      in fish patients, 10
      in psittacines, 30, 144-145
      in rabbits, 128
      in raptors, 69-73
      in rats, 100
      in reptiles, 24
Olfaction, geriatric care for, in psittacines, 32
Omega-3 fatty acids, in geriatric care, for psittacines, 35
Ophthalmology consultation, in geriatric care, for psittacines, 31
      for raptors, 69-71
Opioids, in geriatric care, for psittacines, 29-30, 44
      for rabbits, 129-130
      for raptors, 63
Organ failure, geriatric care for, in raptors, 69
Osteoarthritis, geriatric care for, in psittacines, 32
      in rabbits, 125-126
      in raptors, 57, 60-62, 74
      in rats, 100
Osteoporosis, geriatric care for, in psittacines, 33
Otitis, chronic, in geriatric rabbits, 128
Ovarian cystic disease, geriatric care for, in guinea pigs, 91
      in psittacines, 39
Ovarian neoplasia, geriatric care for, in psittacines, 41, 143, 145
      in rats, 99
Ovulatory cycle, in aging cockatiels, 142-143
Owls, age determination of, 51-56
   intraocular pressure measurement in, 71-73
   torticollis in, 75
Pain, chronic, in aging psittacines, 29-30
Pain management, in geriatric care, for psittacines, 29-30
```

```
for rabbits, 125, 128-131
      for raptors, 62-63
Pancreatic carcinoma, geriatric care for, in psittacines, 41
Pancreatic islet cell hyperplasia/tumors, geriatric care for, in ferrets, 108, 113-114, 116
      in psittacines, 35
Papillary adenoma, bronchogenic, in geriatric guinea pigs, 92
Parathyroid gland hypertrophy, geriatric care for, in psittacines, 36
Perineal dermatitis, geriatric care for, in rabbits, 128, 130
Periodontal disease, geriatric care for, in reptiles, 22
Physical examination, in geriatric care, annual, for psittacines, 43
      for ferrets, 109
      initial, for reptiles, 20
      for raptors, 61
Physical therapy, in geriatric care, for raptors, 63
Physiologic data, on aging psittacines, 135–135
   on ancient rats, 95-96
Pimobendin/pimobendam, in geriatric care, for psittacines, 44
      for rabbits, 125
Pituitary tumors, geriatric care for, in psittacines, 31, 42
      in rats. 101
Pneumoconiosis, geriatric care for, in psittacines, 144
Pododermatitis, geriatric care for, in guinea pigs and chinchillas, 87-88
      in psittacines, 32-33
      in rabbits, ulcerative, 128
Polyarteritis nodosa, geriatric care for, in rats, 99-100
Polyuria/polydipsia (PU/PD), geriatric care for, in guinea pigs and chinchillas, 90
      in psittacines, 34-35
      in rats, 97
Postmortem examination. See Necropsy.
Prednisolone, in geriatric care, for ferrets, 114
Prednisone, in geriatric care, for ferrets, 114
Preputial gland adenitis, geriatric care for, in rats, 98–99
Preventive care, in geriatric care, for ferrets, 109-110
Prostate gland disorders, geriatric care for, in ferrets, 111
      in rats, 99
Protein intake, in geriatric care, for ferrets, 108, 113–114, 119
      for rats, 98, 102
Psittacines, geriatric medicine for, 27-49
      aging pathology in, 135-150
         cardiovascular disease and, 136-140
         disease conditions associated with, 136-137
         integument disease and, 137, 140-141
         liver disease and, 137, 141-142
         musculoskeletal disease and, 137, 142
         nervous system and, 137, 145
         physiology of, 135-135
         reproductive system disease and, 137, 142-143
         respiratory system disease and, 137, 143-144
         special senses and, 144-145
         summary overview of, 135, 147
         tumor oncology and, 137, 145-146
```

R

Rabbits, geriatric care for, **123–133** anesthesia in, 129–130

```
Psittacines (continued)
      annual examination and, 43
      atypical models of, 28-29
         human aging and, 28
         senility/dementia and, 29
      chronic pain and, 29-30
      disease conditions by system and, 30-34
         cardiovascular, 36-38
         endocrine, 35-36
         gastrointestinal, 33-34
         hepatic, 33-34
         musculoskeletal, 32-33
         renal, 34-35, 37, 136-137
         reproductive, 38-39
         special senses, 30-32
      evidence-based, 27-28
      medication administration and, 42-44
         agents mentioned, 43-44
         quality of life with, 42-43
      neoplastic diseases and, 39-42
         biliarv, 41
         endocrine, 35-36, 42
         fibrosarcomas, 40
         gastrointestinal, 33, 41
         hepatic, 41-42
         incidence of, 28, 39
         internal carcinoma, 41
         lipomas, 39-40
         lymphatic, 42
         melanomas, 40
         musculoskeletal, 41
         ovarian, 41
         pancreatic, 35, 41
         pituitary, 31
         respiratory, 42
         squamous cell carcinomas, 40
         treatment of, 42
         xanthomas, 39
      summary overview of, 27
Public aquariums, for geriatric fish patients, 2-3
Pulmonary hypertension syndrome (PHS), geriatric care for, in psittacines, 36
Pulmonary interstitial fibrosis, geriatric care for, in psittacines, 143-144
 Q
```

Quality of life, medication administration and, in geriatric psittacines, 42-43

```
arthritis/degenerative joint disease and, 125-126
      cardiovascular disease and, 124-125
      chronic otitis and, 128
      chronic renal failure and, 123-124, 129
      dental disease and, 127
      drug therapeutics in, 125-126
         modification of, 129-130
      end-of-life issues and, 130-131
      euthanasia in, 131-132
      hospice in, 130-131
      muscle wasting and, 127
      neoplasia and, 124, 128-129
      ocular lesions and, 128
      perineal dermatitis and, 128, 130
      sedation in, 129-130
      splay leg and, 127
      summary overview of, 123
      ulcerative pododermatitis and, 128
      well care in, 123
Radiation therapy, in geriatric care, for ferrets, 115
      for psittacines, 42
      for raptors, 65
Radiography, in geriatric care, for ferrets, 115–116, 118
      for guinea pigs and chinchillas, 87, 89
      for psittacines, 37, 41, 43
      for rabbits, 124
      for raptors, 61, 65-66, 74
      for reptile, 21-22, 24
Raptors, aging, 51-84
      age determination in, 53-54
      disease conditions of, 57, 60-76
         cardiovascular, 65-69
         miscellaneous, 76
         musculoskeletal, 57, 60-63
         neoplasia, 63-65, 75
         neurologic, 71, 74-75
         ocular, 69-73
         organ failure, 69
         reproductive, 74-76
      geriatric divisions of, 53
      human use of, 51-53
         for falconry, 51-52
         wildlife vs., 52-53
         by zoologic institutions, 52
      life expectancy in, 54-57
      longevity records of, 54, 58-59
      morbidity of, 54-57
      mortality of, 54-57
      summary overview of, 51, 76
Rats, ancient, 95-105
      alveolar histiocytosis in, 99
```

```
Rats (continued)
      atherosclerosis in, 100
      central nervous system degenerative changes in, 100
      degenerative osteoarthritis in, 100
      dermatologic disease in, 99
      genitourinary disease in, 98-99
         calculi as, 98
         of female genital track, 99
         of male genital track, 98-99
      husbandry consideration in, 102
      infectious disease in, 101
      liver disease in, 100
      myocardial disease in, 99
      physiologic data on, 95-96
      polyarteritis nodosa in, 99-100
      renal disease in, 96-98
         description of, 96
         diagnostics for, 96-97
         prevention of, 97-98
         treatment of, 98
      retinal degeneration in, 100
      skeletal muscle disease in, 100-101
      summary overview of, 95-96, 102
      tumors in, 99, 101
Renal cysts, geriatric care for, in ferrets, 117-118
Renal disease. See also Urinary entries.
   geriatric care for, in ferrets, 117-119
      in fish patients, 10
      in psittacines, 34-35, 37, 136-137
      in rabbits, 123-124
      in raptors, 69
      in rats, 96-98
         description of, 96
         diagnostics for, 96-97
         prevention of, 97-98
         treatment of, 98
      in reptiles, 23
Renal failure, geriatric care for, in guinea pigs, 91
      in rabbits, acute, 124
         chronic, 123-124, 129
Renal portal shunt disease, geriatric care for, in psittacines, 37
Reproductive system, geriatric care for, in fish patients, 9
      in guinea pigs and chinchillas, 89-92
      in psittacines, 38-39, 137, 142-143
      in raptors, 74-76
      in rats. 98-99
      in reptiles, 23
Reptile geriatrics, 15-25
   age estimation in, 16-20
   clinical considerations for, 20-24
      of cardiovascular system, 23
```

```
of digestive system, 22-23
      of endocrine system, 24
      of immune system, 24
      of integument, 22
      of nervous system, 24
      physical examination as, 20
      radiographs as, 21-22
      of reproductive system, 23
      serial blood sampling and imaging as, 20-21
      of skeletomuscular system, 23
      of special senses, 24
      of urinary system, 23
   initial consultation in, 20
   longevity in, 17-20
   senescence in, 15-16
   summary overview of, 15
Respiratory neoplasia, geriatric care for, in guinea pigs and chinchillas, 92
      in psittacines, 42
Respiratory system, geriatric care for, in psittacines, 137, 143-144
      in raptors, 76
      in rats. 101
      in reptiles, 23
Restraint, in geriatric care, chemical. See Anesthetic agents.
      for ferrets, 109
Rete cystadenomas, geriatric care for, in guinea pigs, 91-92
Retinal degeneration, geriatric care for, in psittacines, 31
      in rats, 100
 S
Sarcomas, geriatric care for, in chinchillas, 92
      in ferrets, 109, 116
      in psittacines, 41, 146
Schirmer tear test (STT), for raptors, 69-70
Scrotal plugs, geriatric care for, in guinea pigs, 89-90
Scurvy, geriatric care for, in chinchillas, 89
      in guinea pigs, 86-87
Sedation, in geriatric care. See also Anesthetic agents.
      for rabbits, 129-130
Seizures, geriatric care for, in rabbits, 130
      in raptors, 74
Seminomas, geriatric care for, in psittacines, 146
Senescence, in geriatric care, for psittacines, age estimation and, 27-28
         pathology of, 135-150. See also Psittacines.
      for raptors, age estimation and, 53-54
      for reptiles, 15-16
         age estimation and, 16-18
Senility/dementia, geriatric care for, in psittacines, 29
      in raptors, 71, 74
Sertoli cell tumors, geriatric care for, in psittacines, 146
Silver sulfadiazine, in geriatric care, for guinea pigs and chinchillas, 87
      for rabbits, 128
```

Skeletomuscular system. See Musculoskeletal system. Smell sense. See Olfaction. Snakes, age estimation of, 19 Special senses, geriatric care for, in psittacines, 29-32, 144-145 in reptiles, 24 Splay leg, geriatric care for, in rabbits, 127 Splenomegaly, geriatric care for, in ferrets, 119–120 Spondylosis, vertebral, in geriatric rabbits, 125-126 Spurs, geriatric care for, in guinea pigs and chinchillas, 88 Squamous cell carcinomas (SCC), geriatric care for, in psittacines, 40 Statins, in geriatric care, for psittacines, 37-38, 44 Steroids, in geriatric care, for ferrets, 114 Surgical management, of adrenal cortical tumors, in senior ferrets, 112 geriatric anesthesia for. See Anesthetic agents. of pancreatic islet cell adenomas, in senior ferrets, 114 of pododermatitis, in geriatric guinea pigs and chinchillas, Synovitis, villonodular, in aging cockatiels, 142 Т Tamoxifen, in geriatric care, for psittacines, 41 Taurine, in geriatric care, for rabbits, 125 Tear test, Schirmer, for raptors, 69-70 Telomeres/telomerase, in aging psittacines, 28, 135–136 Teratoma, geriatric care for, in guinea pigs, 92 Testicular disorders, geriatric care for, in psittacines, 143 in rats, 99 Thiamine deficiency, geriatric care for, in fish patients, 6–7 Thymomas, geriatric care for, in ferrets, 116 in rabbits, 129 in reptiles, 24 Thyroid disorders, geriatric care for, in psittacines, 36 in reptiles, 24 Thyroid hyperplasia, in geriatric fish patients, 7 Torticollis, geriatric care for, in raptors, 74–75 Toxicities/toxicoses, geriatric care for, in ferrets, 118-119 in fish patients, 6 in raptors, 54-55, 71, 74 Tramadol, in geriatric care, for psittacines, 29-30, 44, 61-62 for raptors, 63 Traumatic injuries, geriatric care for, in raptors, 54-57, 60, 69, 71, 74 Tremors, geriatric care for, in raptors, 74 Trichobezoars, geriatric care for, in ferrets, 110 Trichofolliculoma, geriatric care for, in guinea pigs, 91 Tricyclic antidepressants, in geriatric care, for raptors, 63 Tuataras, age estimation of, 19 Tumors. See Neoplasia. Turtles, age estimation of, 19-20

```
U
```

```
Ulcerative dermatitis, in psittacines, 141
Ulcerative pododermatitis, in rabbits, 128
Ulcers, gastrointestinal, in ferrets, 110
Ultrasonography, in geriatric care, cardiac. See Echocardiography.
      for ferrets, 115-118
      for rabbits, 124
      for raptors, 61, 65-66
Uric acid accumulation. See Gout.
Urinalysis, in geriatric care, for psittacines, 34
      for rats, 96-97
Urinary calculi, geriatric care for, in fish patients, 10
      in rats, 98
Urinary system, geriatric care for, in rats, 98-99
         description of, 98
         female genital track, 99
         male genital track, 98-99
      in reptiles, 23
Ursodeoxycholic acid (UDCA), in geriatric care, for psittacines, 34, 44
Uterine tumors, geriatric care for, in guinea pigs and chinchillas, 92
      in rabbits, 128
      in rats, 99
UV light detection, in geriatric psittacines, 30
Vaccines, in geriatric care, for ferrets, 109
Vacuolar myelinopathy, geriatric care for, in raptors, 74
      in rats, 100
Vaginitis, geriatric care for, in guinea pigs, 89-90
Valvular disease, cardiac, geriatric care for, in rabbits, 124-125
Venipuncture, in geriatric care, for ferrets, 109
Vision, geriatric care for. See also Ocular disease.
      in fish patients, 10
      in psittacines, 30-31
      in reptiles, 24
Vitamin A deficiency, geriatric care for, in psittacines, 33, 35
Vitamin B supplementation, in geriatric care, for rats, 100
Vitamin C deficiency, geriatric care for, in guinea pigs, 86-87
Vitamin D deficiency, geriatric care for, in fish patients, 6
      in psittacines, 33
 w
Well care, for geriatric rabbits, 123
 X
Xanthomas, geriatric care for, in psittacines, 39, 146
```

Z

Zoologic institutions, use of raptors by, 52